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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	10/658,964
Filing Date	September 9, 2003
First Named Inventor	SYLVAN, Dale A.
Group Art Unit	3683
Examiner Name	KRAMER, Devon C.
Total Number of Pages in This Submission: 19	Attorney Docket Number: 202241-0028

ENCLOSURES *(check all that apply)*

- ☐ Fee Transmittal Form
- ☒ Fee Attached
- ☐ Amendment / Response
- ☐ After Final
- ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Response to Missing Parts/ Incomplete Application
- ☐ Response to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Assignment Papers *(for an Application)*
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition Routing Slip (PTO/SB/69) and Accompanying Petition
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation Change of Correspondence Address
- ☐ Terminal Disclaimer
- ☐ Small Entity Statement
- ☐ Request for Refund
- ☐ After Allowance Communication to Group
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☒ Appeal Communication to Group *(Appeal Notice, Brief, Reply Brief)*
- ☐ Proprietary Information
- ☐ Status Letter
- ☒ Additional Enclosure(s) *(please identify below)*:

Transmittal of Appellant's Appeal Brief; Return receipt postcard

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name	Barry W. Sufrin, Reg. No. 27,398 Gardner Carton & Douglas LLP
Signature	Barry W. Sufrin
Date	February 7, 2005

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class mail in an envelope addressed to: Mail Stop Appeal Brief – Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this date February 7, 2005

Typed or printed name	Mark J. Sweetin		
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PATENT
Attorney Docket No. 202241-0028

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:

Sylvan et al.

Application No. 10/658,964

Filed: September 9, 2003

For: BRAKING SYSTEM

Art Unit: 3683

Examiner: KRAMER, Devon C.

TRANSMITTAL OF
APPELLANT'S APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Dear Sir:

In accordance with 37 CFR 1.192, appellant hereby submits Appellant's Brief on Appeal in triplicate.

The items checked below are appropriate:

1. Status of Appellant

This application is on behalf of ☒ other than a small entity or ☐ a small entity.

The verified statement ☐ is attached or ☐ was filed on .

2. Fee for Filing Brief on Appeal

Pursuant to 37 CFR 1.17(e), the fee for filing the Brief on Appeal is for: ☒ other than a small entity or ☐ a small entity.

Brief Fee Due $500.00

3. Oral Hearing

☐ Appellants request an oral hearing in accordance with 37 CFR 1.194.

CERTIFICATE OF MAILING

I hereby certify that this document (along with any documents referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Date: February 7, 2005

Mark J. Sweetin

4. Extension of Time

☐ Appellants petition for a one-month extension of time under 37 CFR 1.136, the fee for which is $110.00

☒ Appellants believe that no extension of time is required. However, this conditional petition is being made to provide for the possibility that appellants have inadvertently overlooked the need for a petition and fee for extension of time.

Extension fee due with this request: $

5. Total Fee Due

The total fee due is:

Brief on Appeal Fee	$500.00
Request for Oral Hearing	$ 0.00
Extension Fee (if any)	$ 0.00

Total Fee Due: $500.00

6. Fee Payment

☐ Attached is a check in the sum of $
☒ Charge Account No. 07-0181 the sum of $500.00. A duplicate of this transmittal is attached.

7. Fee Deficiency

☒ If any additional fee is required in connection with this communication, charge Account No. 07-0181. A duplicate copy of this transmittal is attached.

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Date: February 7, 2005

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:

Sylvan et al.

Application No. 10/658,964

Filed: Sep. 9, 2003

For: BRAKING SYSTEM

Art Unit: 3683

Examiner: Kramer, Devon C.

APPELLANT'S BRIEF ON APPEAL

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Dear Sir:

In support of the appeal from the final rejection dated September 8, 2004, Appellants now submit their Brief. Specifically, this is an appeal from the Final Rejection of Examiner Kramer mailed September 8, 2004, rejecting all of the pending claims of the case

I. REAL PARTY IN INTEREST

The real party in interest is the assignee, MPC Products Corporation.

II. RELATED APPEALS AND INTERFERENCES

To the best of the Applicant's knowledge, there are no pending appeals or interferences that would directly affect or be affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

Claims 1-11 and 13-21 are pending. Claim 12 has been canceled.

IV. STATUS OF AMENDMENTS

As understood by Applicant, all amendments filed in the application have been entered.

V. SUMMARY OF INVENTION

The present invention is directed toward a braking system for braking a rotatable shaft. Although useful in various applications, the invention is particularly useful for holding a component fixed in a high-vibration environment, such as an embodiment in which the shaft acts as a hinge on a door, such as a cargo door of an aircraft. Specification, p. 2, lines 25-27, p. 5 lines 5-6.

An embodiment of the braking system 10 is illustrated in FIG. 1. The illustrated braking system 10 includes a brake disc 12 that is configured to engage a brake plate 14. The brake disc 12 is coupled to an insert 17 that is coupled to the shaft 17. The shaft 16 is mounted for rotation relative to a base member 18. When the shaft 16 rotates, the brake disc 12 rotates relative to the brake plate 14. In a normal condition, springs 20 bias the brake plate 14 toward the brake disc 12. Specification p. 2, line16 though p. 3, line 6. To release the braking force, coils 52 are energized so as to attract the base member 18 to move. Because the brake plate 14 is carried on the base member 18, the brake plate 14 is retracted away from the brake disc 12. In another embodiment, it is possible to configure the system so that the brake is normally released and applies braking only when the coils are energized. Specification, p. 3, lines 7-20.

Each of the brake disc 12 and the brake plate 14 is configured with cooperatively mateable plateaus and recesses that can interlock in an engaged condition. More specifically, referring to FIG. 2, the brake disc 12 is illustrated having three disc plateaus 26 located at equal angular spacing from each other. Each of the disc plateaus 26 has two disc ramps 28 that form a shallow transition between the disc face 24 and a top surface 30 of the disc plateau. Disc recesses 32 are defined between the plateaus 26. In the embodiment with three plateaus, the plateaus are angularly spaced 120° from each other. Also, the plateaus preferably occupy about one half of the circumference of the disc 12. The ramps are

preferably angled at about 10° relative to the disc face 24. Specification, p. 3, lines 21-32.

Turning to FIG. 3, the brake plate 14 has a plate face 34 that has a series of plate plateaus 36 that generally correspond the disc plateaus 24 of the brake disc 12 (FIG. 2), in that the same number are provided at matched angular spacing. Each of the plate plateaus 36 includes a top surface 40 and a pair of ramps 38 that form a shallow transition of about 10° between the plate face 34 and top surface 40. The angle of the disc ramps 28 and the plate ramps 38 preferably match (e.g. 10° and 10°, respectively) or are selected so as to correspond with one another (e.g., one at 9° and the other at 11°), and the angle of the ramps 28, 38 is preferably shallow, i.e., between 5° and 20°. Specification, p. 4, lines 1-10.

When the brake disc 12 is fully engaged with the brake plate 14, the top surfaces 30 of the disc plateaus 26 mate with the plate recesses 42, and the top surfaces 40 of the plate plateaus 36 mate with the disc recesses 32 of the brake disc. Also, the disc ramps 28 are engaged against the plate ramps 38. A sufficient amount of predetermined torque can overcome the set brake force. If a sufficient amount of torque is applied to the shaft 16, brake disc 12 can rotate when the disc 12 overcomes the bias of spring 20, such that the disc plateaus 26 ride up the plate ramps 38 onto the plate plateaus 36. Conversely, when the rotating disc 12 rotates free from the plate 14 and then is moved into contact with the plate 14, initially the respective surfaces 30 and 40 slide against each other, providing a frictional braking effect, and then the respective plateaus and recesses cooperatively seat in a mechanical engagement, thereby "locking" the shaft. Specification, p. 4, line 20 through p. 5, line 4.

VI. ISSUES

The issue on appeal is whether claims 1-11 and 13-21 are obvious in view of and, therefore, unpatentable over U.S. Patent No. 6,155,386 ("Hirai et al.") in view of U.S. Patent No. 1,756,907 ("Payne"), under 35 U.S.C. § 103(a).

VII. GROUPING OF CLAIMS

Each of independent claims 1, 7, and 15 stands alone. Dependent claims 2, 4-6, 11 , 14, and 21 stand or fall together.

VIII. ARGUMENT

The Examiner has rejected all of the claims 1-11 and 13-21 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,155,386 ("Hirai et al.") in view of U.S. Patent No. 1,756,907 ("Payne"). The Examiner's rejection should be reversed with respect to the various claims for the reasons set forth below.

A. Payne and Hirai et al Fail To Teach Recesses and Plateaus That Are Dimensioned to Mate, As Required By Claims 1 and 7

To establish a *prima facie* case of obviousness, all of the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

Applicant first directs the Board's attention to independent claims 1 and 7, directed to a braking system apparatus. Claim 1 recites:

> A braking system for a shaft mounted for rotation, the braking system comprising:
>
> a brake disc ... including a disc face having a plurality of disc plateaus ...
>
> a brake plate ... including a plate face positioned substantially parallel and adjacent to the disc face and including a plurality of plate plateaus corresponding to the number of disc plateaus, ... **the plate plateaus defining recesses between consecutive plate plateaus that are dimensioned to correspond to the disc plateaus such that the disc plateaus mate with the recesses** ...

(emphasis added).

Independent claim 7 recites:

> A braking system for braking a rotatable shaft, the system comprising:
>
> a brake plate moveable between an engaged position and a retracted position, the brake plate including a plate face having a plurality of plate plateaus ...
>
> a brake disc mounted to the shaft for rotation relative to the brake plate, the brake disc including a disc face positioned substantially parallel and adjacent to the plate face and including a plurality of disc plateaus, ... **the disc plateaus defining recesses between consecutive disc plateaus that are dimensioned to correspond to the plate plateaus such that the plate plateaus mate with the recesses**...

(emphasis added).

Assuming *arguendo* that the Hirai et al. or Payne references would have been obvious to combine, such a combination would fail to yield the invention claimed in independent claims 1 and 7 because Hirai et al. and Payne fail to teach all of the claimed features. In particular, the references fail to teach the matable plateaus and recesses as indicated in the above highlighted language of claims 1 and 7.

The Examiner admits that "Hirai et al. lacks the teaching of the plurality of plateaus and recesses on both the brake disk and brake plate." (Office action dated Sep. 8, 2004, page 2, paragraph 2). The Examiner merely concludes:

> It would have been obvious to one having ordinary skill in the art at the time of the invention to have provided the contacting disc and plate surfaces of Hirai et al. with the plurality of plateaus and recesses as taught by Payne in order to positively lock the plate to the disc in order to prevent further relative motion.

(Office Action dated Sep. 9, 2005, pp. 2-3, paragraph 2).

Applicant respectfully disagrees. Payne fails to teach a structure in which corresponding plateaus and recesses on respective discs are dimensioned to mate. Payne teaches an electromagnetic clutch in which opposing plates contain grooved "torque

producing areas" B1, B2, D1, D2. Payne explains that these "torque producing areas" are not interlocking or mating. Rather, the grooves in Payne are provided "in order to increase the carrying capacity of the lines of [magnetic] force at their engaging edges." (*See,* Payne, p. 2, col. 1, lines 19-21). Thus, Payne teaches to the contrary of the rejected claims that the circumferential pressure rings E and F (See Fig. 1) **prevent** the grooves and projections from mating, as expressly claimed in claims 1 and 7. Specifically, Payne states:

> By reason of the separate pressure surfaces E and F it becomes possible to place the grooves **quite close together** as shown in the enlarged views in Figures 3, 4 and 5, and to make their mean width somewhat greater than that of the intervening tooth projections **without danger of interlocking or of too great wear on the engaging faces of the poles.**

Payne, p. 2, col. 1, lines 21-29 (emphasis added). In the device taught by Payne, by design, any contact between the "torque producing areas" B1, B2 and D1, D2 occurs only on their peak surfaces as shown in Figs. 3-5, not on the angled recessed portions. The pressure rings E and F render it structurally impossible for the grooved torque producing areas B1, B2 and D1, D2 to mate. Moreover, as can be seen in FIG. 5 of Payne, the top surfaces of the grooves are significantly wider than the bottom surfaces, thus, the torque producing areas are not shaped to correspondingly mate in any case. Thus, the unmateable type of grooves taught by Payne, even if combined with the features of Hirai, would not yield the structure claimed in claims 1 and 7.

In view of the foregoing, the Payne and Hirai references fail to teach or suggest key features of independent claims 1 and 7. Therefore, Applicant respectfully submits that the Examiner has failed to establish a *prima facia* case of obviousness of claims 1 and 7 based upon the prior art as required by 35 U.S.C. §103, and the rejection should be reversed.

Claims 1 and 7 do not stand and fall together, as claim 7 includes features relating to the ramp angle that are believed independently patentable for the reasons addressed herein at

Sections VIII (C) and (D). Dependent claim 3 stands or falls with claim 1, and dependent claims 8-10 and 13 stand or fall with claim 7.

B. Payne Teaches Away From A Combination That Would Yield The Mated Recesses and Plateaus Of Claims 1 and 7

The Examiner fails to appreciate that Payne and Hirai lack any suggestion for the proposed combination. Moreover, Payne teaches directly away from a combination that would yield the claimed features, and accordingly, one of ordinary skill in the art would not have been motivated to combine the alleged teachings of Hirai et al and Payne so as to arrive at the present invention. In order to establish a proper obviousness rejection under 35 U.S.C. § 103 (a) based on a combination of prior art, the Examiner must show some motivation, suggestion, or teaching to make the specific combination claimed by the Applicant. *In re Kotzab*, 217 F.3d 1365 (Fed. Cir. 2000), citing *In re Dance*, 160 F.3d 1339, 1343 (Fed Cir. 1998). Here, the Examiner fails to cite any suggestion, motivation, or teaching in the art for the proposed combination.

As discussed above, Payne, directed to a magnetic clutch, teaches grooves and projections for the purpose of increasing magnetic force fields. Payne fails to suggest that grooves and projections should dimensioned to be physically locked, and this reference fails even to suggest that grooves and projections could be used outside of a magnetic clutch application. Furthermore, because Payne teaches that interlocking between plates should be avoided and physically prevented, as discussed above, Payne expressly teaches away from a combination that would yield a matable relationship between the plateaus and recesses as claimed in claims 1 and 7 of the present application.

As a result, one of ordinary skill in the art at the time of the invention would not have been motivated to combine the alleged teachings of Payne and Hirai in an effort to achieve

the invention of claims 1 and 7. For this further reason, the Examiner's rejection of claims 1 and 7 is incorrect and should be reversed accordingly.

Claims 1 and 7 do not stand and fall together, as claim 7 includes features relating to the ramp angle that are believed independently patentable for the reasons addressed herein at Sections VIII (C) and (D). Dependent claim 3 stands or falls with claim 1, and dependent claims 8-10 and 13 stand or fall with claim 7.

C. The References Relied On By The Examiner Fail To Teach The Degree Of Ramp Incline Required By Claims 2, 4-7, 11, 14 & 21

Independent claim 7 and dependent claims 2, 4-6, 11, 14, and 21 require specific angles of ramp surfaces. Such features are not taught or suggested by either Hirai et al. or Payne. Specifically, claims 2, 4-7, 11, 14 and 21 contain limitations relating to the decree of incline of ramp structures, as follows:

- Claim 2: "the disc ramp is angled approximately 10° relative to the disc face"
- Claim 4: "the disc ramp is angled approximately 10° relative to the disc face"
- Claim 5: "the plate ramp is angled approximately 10° relative to the plate face"
- Claim 6: "the disc ramp is angled at an angle of between approximately 5° and 20°"
- Claim 7: "the disc ramps being angled at an angle of between approximately 5° and 20°"
- Claim 11: "the plate ramps and the disc ramps are angled at approximately 10°"
- Claim 14: "the plate ramps and the disc ramps are angled at approximately 10°"
- Claim 21: "the disc ramps being angled approximately 10° relative to the disc face and the plate ramps being angled approximately 10° relative to the plate face."

Hirai et al fails to teach ramps, and the Examiner acknowledges that "Payne is silent to the angle of the ramps." Office Action dated Sept. 8, 2004, ¶ 2, p. 3. Referring to the

Figures of Payne, particularly FIG. 5, the sides of torque producing areas lie at an angle significantly greater than 10°. The hexagonal geometry formed by the oppositely aligned grooves as shown in FIG. 3 of Payne teaches that the angle is about 60°.

In view of the foregoing, the Payne and Hirai references fail to teach or suggest the ramp angles with respect to a disc or plate face as recited in claims 2, 4-7, 11, 14, and 21. Therefore, Applicant respectfully submits that the Examiner has failed to establish a *prima facia* case of obviousness of claims 2, 4-7, 11, 14, and 21 based upon the prior art, and the rejection should be reversed.

Claims 2, 4-7, 11, 14, and 21 do not stand and fall together. Claim 7 includes features believed independently patentable for the reasons set forth above in Sections VIII (A) and (B).

D. The Ramp Incline Angle In Claims 2, 4-7, & 21 Would Not Have Been An Obvious Design Choice

The Examiner acknowledges that Payne is silent as to the angle of the ramps (Office action dated Sept 8, 2004, p. 3, first full paragraph), but nevertheless concludes that the claimed angles would have been a mere design choice based on the materials used and the force desired to be absorbed by the ramps. (Office Action of Sept. 8, 2004, ¶2, p. 3). The Examiner notes that "it would have been obvious to make the ramp angles 10 degrees since it has been held that where the general conditions of a claim are disclosed in the art, discovering the optimum or workable ranges involves only routine skill in the art." (*Id.*, citing *In re Aller*, 105 USPQ 233).

Firstly, deficiencies of references cannot be saved by appeals to "common sense" and "basic knowledge" without any evidentiary support. In re Zurko, 258 F.3d 1379 (Fed. Cir. 2001). Applicant respectfully points out that the Examiner has shown no evidentiary support for his argument that the angle of the disc ramp was merely a design choice.

Secondly, even on the alleged grounds of rejection stated by the Examiner, the rejection is improper because the Examiner has failed to establish that the "general conditions" of claims 2, 4-7, 11, 14, and 21 have been disclosed in the art. The claimed ramp angles are not arbitrary. Rather, the purpose of the claimed angles is directly related to the claimed recesses and plateaus, such that the angles have been selected so as to permit the ramps to ride along one another as the corresponding recesses and plateaus discs seat or unseat upon rotation of the engaged disc and plate. (*See,* Specification, p. 4, lines 1-10, p. 4, line 24 through p. 5, line 4). The approximate 10° angle of the disc ramp was selected for the purpose of allowing dynamic engagement of the plateaus at high speed without damage. If the angle is too shallow, the brake plate will creep under vibration up the disc ramps, causing the braking system to fail in high vibration environments. If the angle is too steep, the plateaus of the brake plate will be damaged due to the high impact loading thereon originating from the high speed engagement with the disc plateaus. Therefore, the disc ramp angled approximately 10° relative to the disc face is not obvious because it must achieve the dual function of high-speed dynamic engagement without damage and holding under continuous high torque simultaneously with applied vibration. Since the areas B1, B2 and D1, D2 of Payne do not interlock or mate with grooves W defined between the areas, the disclosure of Payne is unrelated to the claimed invention and a feature that is based on dynamic engagement would not be obvious from the disclosure of Payne.

One can not merely say that a dynamic engagement feature is obvious in view of an unrelated art that actually teaches away from dynamic engagement. As explained above in connection with claims 1 and 7, the Examiner has failed to cite a teaching in the prior art of a mated engagement between corresponding recesses and plateaus of an opposed brake disc and brake plate, and the Examiner has failed to cite a suggestion or teaching that would have motivated one of ordinary skill in the art provide an interlocking structure. The claimed

ramps associated with the claimed plateaus and recesses are yet further removed from the teachings of the art.

In other words, the Examiner has failed to cite any teaching or suggestion in the prior art of ramps that function as the ramps of the present invention, and it follows that one of ordinary skill in the art would not have been motivated to design the ramps of the claimed invention in the first place. Therefore, the claimed ramp angle cannot be dismissed under §103 as a mere "design choice" and the rejection of claims 2, 4-7, 11, 14, and 21 on this basis should be reversed.

Claims 2, 4-7, 11, 14, and 21 do not stand and fall together. Claim 7 is an independent claim and includes features believed independently patentable for the reasons set forth above in Sections VIII (A) and (B).

E. Payne and Hirai et al Fail To Teach The Features of Claims 15

Independent claim 15 recites:

> A method of braking a rotating shaft, the method comprising:
>
> attaching the shaft to a brake disc, the brake disc having a disc face with shallow disc plateaus protruding from it; and
>
> providing a brake plate with a plate face and **a spring force to selectively engage the plate face of the brake plate with the disc face of the brake disc, the plate face having shallow plate plateaus protruding from it, the spring force being chosen to permit the disc plateaus to slide over the plate plateaus in a dynamic braking portion of the method and prevent sliding of the disc plateaus over the plate plateaus in a locking portion of the method.**

Claim 15 requires a spring force chosen to selectively engage the brake plate and disc face to permit or to prevent sliding. The Examiner has cited no teaching of such a feature in either Hirai et al or Payne. For the reasons set forth above in Sections VIII (A) and (B) in connection with claims 1 and 7, the alleged teachings of Payne and Hirai et al fail to teach engageable plateaus and recesses. The additional method feature of providing a spring force operable for dynamic engagement in the manner claimed in claim 15 is unique. Accordingly,

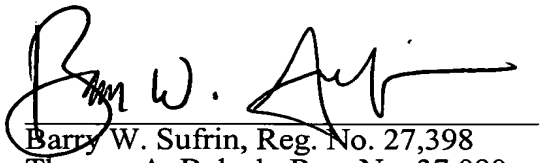
the Examiner has failed to establish a *prima facie* case of obviousness with respect to claim 15, and the rejection of this claim should be reversed. Claim 15 stands or falls alone.

Dependent claims 16-20 stand or fall with claim 15.

VIX. CONCLUSION

For the above reasons, the Board is respectfully requested to reverse the Examiner.

Respectfully submitted,



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Date: February 7, 2005
Appeal Brief (Revised 3/11/2002)

APPENDIX

PENDING CLAIMS

1. A braking system for a shaft mounted for rotation, the braking system comprising:

a brake disc coupled to the shaft for rotation therewith, the disc including a disc face having a plurality of disc plateaus positioned around the circumference of the disc, each disc plateau including a disc ramp extending between the disc face and a top surface of the disc plateau;

a brake plate mounted to be relatively stationary, the brake disc being rotatable with respect to the brake plate, the brake plate including a plate face positioned substantially parallel and adjacent to the disc face and including a plurality of plate plateaus corresponding to the number of disc plateaus, each plate plateau including a plate ramp extending between the plate face and a top surface of the plate plateau, the plate ramps being angled relative to the plate face at approximately the same angle at which the disc ramps are angled relative to the disc face, the plate plateaus defining recesses between consecutive plate plateaus that are dimensioned to correspond to the disc plateaus such that the disc plateaus mate with the recesses; and

a spring, the disc face and the plate face being biased against each other by the spring.

2. The braking system of claim 1, wherein the disc ramp is angled approximately 10° relative to the disc face.

3. The braking system of claim 1, wherein the plurality of disc plateaus comprises three plateaus.

4. The braking system of claim 3, wherein the disc ramp is angled approximately 10° relative to the disc face.

5. The braking system of claim 4, wherein the plate ramp is angled approximately 10° relative to the plate face.

6. The braking system of claim 1, wherein the disc ramp is angled at an

angle of between approximately 5° and 20°.

7. A braking system for braking a rotatable shaft, the system comprising:

a brake plate moveable between an engaged position and a retracted position, the brake plate including a plate face having a plurality of plate plateaus positioned around the circumference of the brake plate, each plate plateau including a plate ramp extending between the plate face and a top surface of the plate plateau, the plate ramps being angled at an angle of between approximately 5° and 20°;

a coil that is powered to create a magnetic field to move the brake plate between its engaged and retracted positions;

a brake disc mounted to the shaft for rotation relative to the brake plate, the brake disc including a disc face positioned substantially parallel and adjacent to the plate face and including a plurality of disc plateaus, each disc plateau including a disc ramp extending between the disc face and a top surface of the disc plateau, the disc ramps being angled at an angle of between approximately 5° and 20° relative to the disc face, the disc plateaus defining recesses between consecutive disc plateaus that are dimensioned to correspond to the plate plateaus such that the plate plateaus mate with the recesses; and

a spring, the disc face and the plate face being biased against each other by the spring.

8. The braking system of claim 7, wherein the number of plate plateaus is equal to the number of disc plateaus.

9. The braking system of claim 8, wherein the plate ramps are angled at the same angle as the disc ramps.

10. The braking system of claim 9, wherein there are three plate plateaus and three disc plateaus.

11. The braking system of claim 10, wherein the plate ramps and the disc ramps are angled at approximately 10°.

12. (Cancelled)

13. The braking system of claim 7, wherein there are three plate plateaus and three disc plateaus.

14. The braking system of claim 7, wherein the plate ramps and the disc ramps are angled at approximately 10°.

15. A method of braking a rotating shaft, the method comprising:

attaching the shaft to a brake disc, the brake disc having a disc face with shallow disc plateaus protruding from it; and

providing a brake plate with a plate face and a spring force to selectively engage the plate face of the brake plate with the disc face of the brake disc, the plate face having shallow plate plateaus protruding from it, the spring force being chosen to permit the disc plateaus to slide over the plate plateaus in a dynamic braking portion of the method and prevent sliding of the disc plateaus over the plate plateaus in a locking portion of the method.

16. The method of claim 15, wherein there are three disc plateaus and three plate plateaus.

17. The braking system of claim 1, wherein the plate face is biased toward the disc face by the spring.

18. The braking system of claim 7, wherein the plate face is biased toward the disc face by the spring.

19. The braking system of claim 7, wherein the spring engages the brake plate and biases the plate face toward and against the disc face.

20. The method of claim 15, further comprising applying the spring force to the brake plate and biasing the plate face toward and against the disc face with the spring force.

21. The method of claim 15, wherein each disc plateau includes a disc ramp extending between the disc face and a top surface of the disc plateau, and wherein the plurality of plate plateaus correspond to the number of disc plateaus and each plate plateau includes a plate ramp extending between the plate face and a top surface of the plate plateau, the disc ramps being angled approximately 10° relative to the disc face and the plate ramps being angled approximately 10° relative to the plate face.